

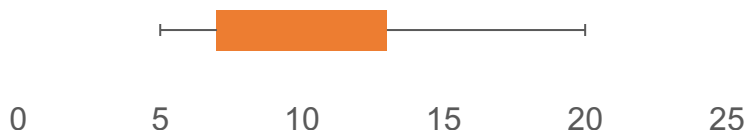


Box-and-whisker Plots

REVISION: Box-and-whisker Plots

- The five-number summary includes the minimum, 1st quartile, 2nd quartile (median), 3rd quartile and maximum
- The 1st quartile is considered the median of the lower quartile, between the minimum and the median of the data set
- The 3rd quartile is considered the median of the upper quartile, between the median of the data set and the maximum
- The interquartile range (IQR) is measured as the difference between the third and first quartile
- To identify outliers, a general rule of thumb is that they lie over a $1.5 \times \text{IQR}$ distance below Q1 and above Q3. If present, whiskers extend to the further data point in the set that is not an outlier.

SAMPLE BOX PLOT:



Maths Test Scores

Scores from the Year 10 Maths test for classes 10A ($n = 24$) and 10B ($n = 24$) are shown in the tables below. Data is shown as percentages.

Class 10A

65	75	64	48	59	85	81	70	95	98	87	84
83	90	72	100	64	77	75	55	82	66	91	98

Class 10B

91	70	52	97	86	90	74	50	60	67	72	59
85	56	76	70	15	68	92	86	94	57	88	70



Questions

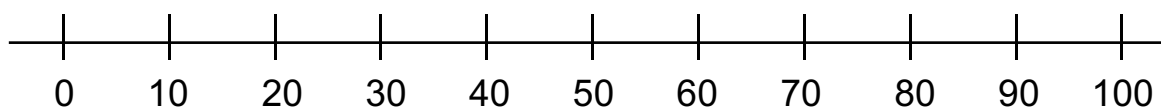
1. Order each data set from smallest to largest.

Class 10A

Class 10B

2. Determine the five-number summary and IQR for both classes.

3. Construct box-and-whisker plots for each data set. Identify any outliers.





4. Describe the skewness of each data set.

Note: If the tail of the distribution is to the left, the data is negatively skewed (skewed to the left). If the tail is to the right, the data is positively skewed (skewed to the right). Symmetrical distributions occur when the data is central. Bi-modal distributions have two peaks.

5. Interpret and compare the box and whisker plots.

6. Determine the percentage difference in average test scores between the two classes. Discuss whether or not the effect of an outlier would impact this difference.
